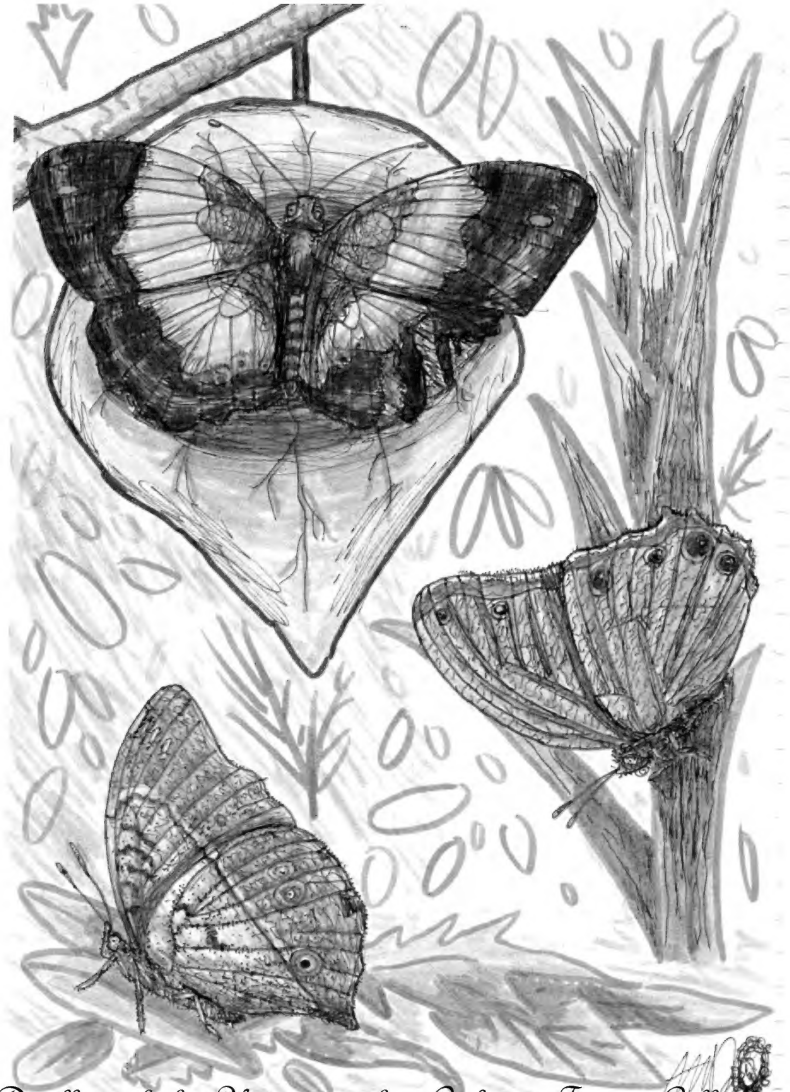

Dwellers of the Undergrowth - Ambrose Treacy College

METAMORPHOSIS

AUSTRALIA

Magazine of the Butterfly & Other Invertebrates Club

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Planning and Organization Meetings

A quarterly meeting is scheduled in order to plan club activities and the magazine. See BOIC Programme.

Contact Address and Membership Details

PO Box 2113, Runcorn, Queensland 4113
Membership fees are $30 for individuals, schools, and organizations.

Aims of the Organization

- To establish a network of people growing butterfly host plants;
- To hold information meetings about invertebrates;
- To organize excursions around the theme of invertebrates e.g. butterflies, native bees, ants, dragonflies, beetles, freshwater habitats, and others;
- To promote the conservation of the invertebrate habitat;
- To promote the keeping of invertebrates as alternative pets;
- To promote research into invertebrates;
- To encourage the construction of invertebrate friendly habitats in urban areas.

Magazine Deadlines

If you wish to submit an item for publication the following deadlines apply:
March issue – February 1st June issue – May 1st
September issue – August 1st December issue – November 1st
All articles should be submitted directly to the Editor daphne.bowden1@bigpond.com

Cover Drawing

Dwellers of the Undergrowth – Ambrose Treacy College
Drawing by Alexander Davies

FROM THE PRESIDENT

For those of you who get around to reading my quarterly ruminations I expect you notice a recurrent theme. This is to stress the thanks we owe to the many people who make this magazine an interesting and informative read.

At times I need to add the adjective "inspiring" and I do so now. It is indeed inspiring to learn of the contribution Alexander Davies has made in restoring habitat near his school, of the effect that restoration has already made, of the expected further results and, behind the scenes, the influence it has had, and will continue to have, on his school community. Added to this is the fact that this teenager has written his well-illustrated report and then drawn the cover illustration as well. Congratulations Alex.

Dave St Henry has been inspiring students in Rockhampton schools for many years, so it is good to have him share a little of his recent success with them. Great images Dave.

Please continue to share your interests and inspiration with us.

Inside you will read about the "history" of the club's host plant book which has been very well received over the years. Since the club was only formed in 1994 you will see that the book has a "pre-history" dating from 1992. Thanks to John Moss for compiling the new information since 2010 which has been added to this our 4th edition.

We are looking to publish a calendar to celebrate the 25th anniversary of the founding of the club and, to help determine the demand it would be great if you could send a brief response indicating if you would like to purchase a copy (info@boic.org.au). I invite you to send images which may be included in the calendar.

Best wishes *Ross*

IN THIS ISSUE

CREATURE FEATURE

Brother's Gully A story of habitat regeneration increasing biodiversity

Alexander Davies

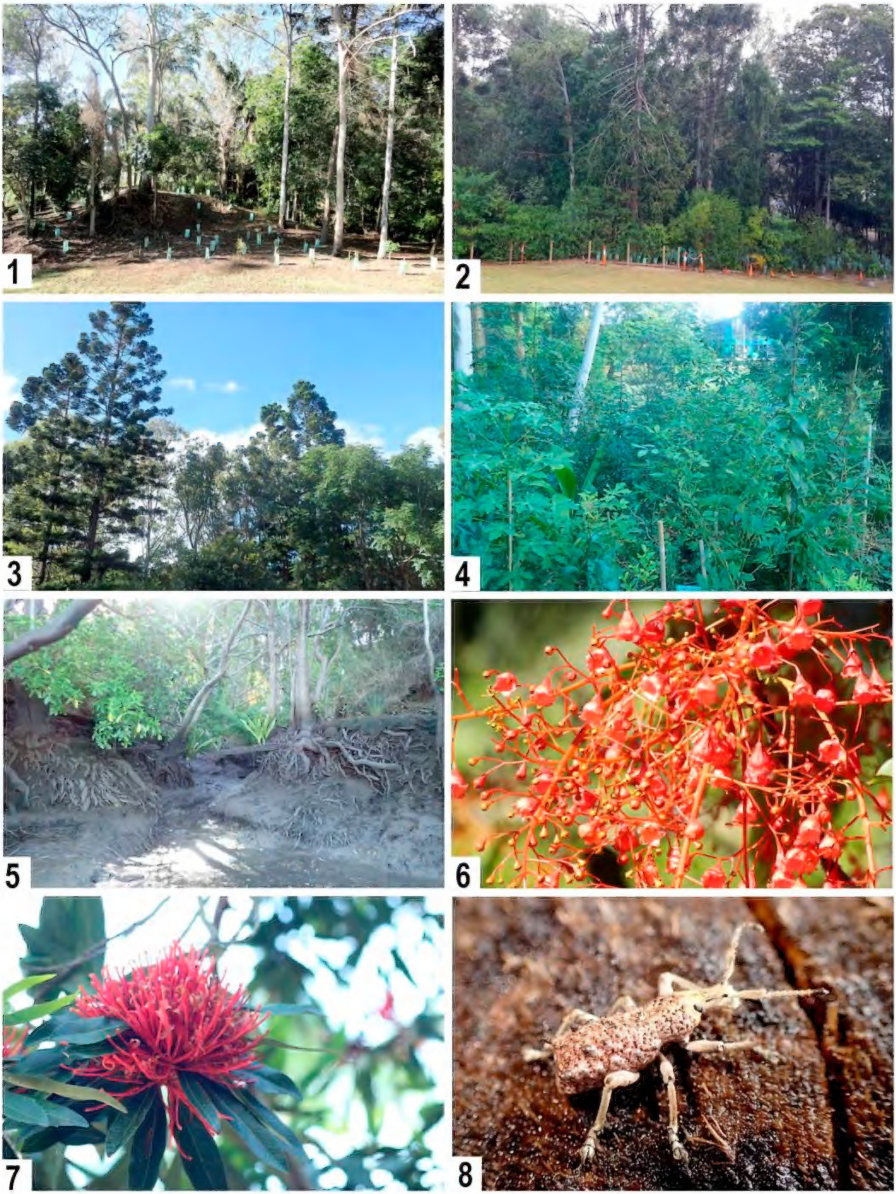
Introduction

The gully, or how it is officially referred to as *Brother's Gully*, is a patch of sub-tropical riparian rainforest adjoining mangroves, located at the south western end of Ambrose Treacy College, Twigg Street, Indooroopilly, Brisbane. The gully area starts at the top of Kate Street, Indooroopilly, and stretches for 140m till it reaches the riverbank. The regeneration runs the length of *Brother's Gully* area and continues for 500m downstream along the bank of the Brisbane River. The site is a unique relic patch of forest with many unique and interesting plant and animal species that are not found in neighbouring lowland areas, north or south of *Brother's Gully*. My journey with regeneration of this site began towards the end of 2015 when, as a student at the college, I noticed this large area of forest left and neglected with significant incursions of Cat's Claw Creeper, and the sight of beautiful rainforest trees being covered with this pest, plus several other invasive weeds, was an unbearable sight to me. With the help of my grandparents (Trevor and Tina Lambkin) and several of my teachers at Ambrose Treacy College, I began a project to attempt to regenerate *Brother's Gully* to its former glory as a stand of Brisbane River riparian rainforest. Subsequently, the project was greenlit and henceforth *Brother's Gully* began. To this day a dedicated team of 'gully men' (Ambrose Treacy students) are actively working with me to bring this project to completion.

History

The original *Brother's Gully* was planted with a range of trees by the Christian Brothers who once ran the old Nudgee Junior College (1936-2014). Their plantings included peaches, lemons, jacarandas, and coral trees among others; and these trees have since been removed. The planting of these exotic tree species inadvertently led to many weed species being introduced. Additionally, in the gully is what remains of a 'ghostly' old rope' treetop course located in the tree canopy where once the Nudgee Junior boys and teachers conducted team building exercises. Eventually, the ropes course was abandoned and left derelict, and gardening conducted in the gully was halted, so over time, weeds and introduced species began to flourish.

The regeneration of *Brother's Gully* began in 2016. This first year was spent removing exotic ground covers, cutting down weed trees and eradicating invasive vines. I also began the process of planting fast-growing species that would create a dense canopy of medium height over a short period of time. The following year, in 2017, we mostly planted out native trees in new areas adjacent to the existing riparian area that had no existing plants, mostly the areas close to Kate Street and close to the Brisbane River. We also held back weed invasion. The third year, 2018, was spent mostly planting understorey species, particularly fern, palm and vine species.



Figs 1-8. '*Brother's Gully*'. (1) revegetation 2016, (2) revegetation 2017, (3) forest canopy, (4) revegetation 2018, (5) mangrove end of gully with swamp lilies, (6) flame tree flowers (*Brachychiton acerifolius*), (7) wheel of fire flower (*Stenocarpus sinuatus*), (8) Curculionidae.

The main theme of the replanting was specifically to increase plant biodiversity with an overall theme of a botanical collection of Australian rainforest species.

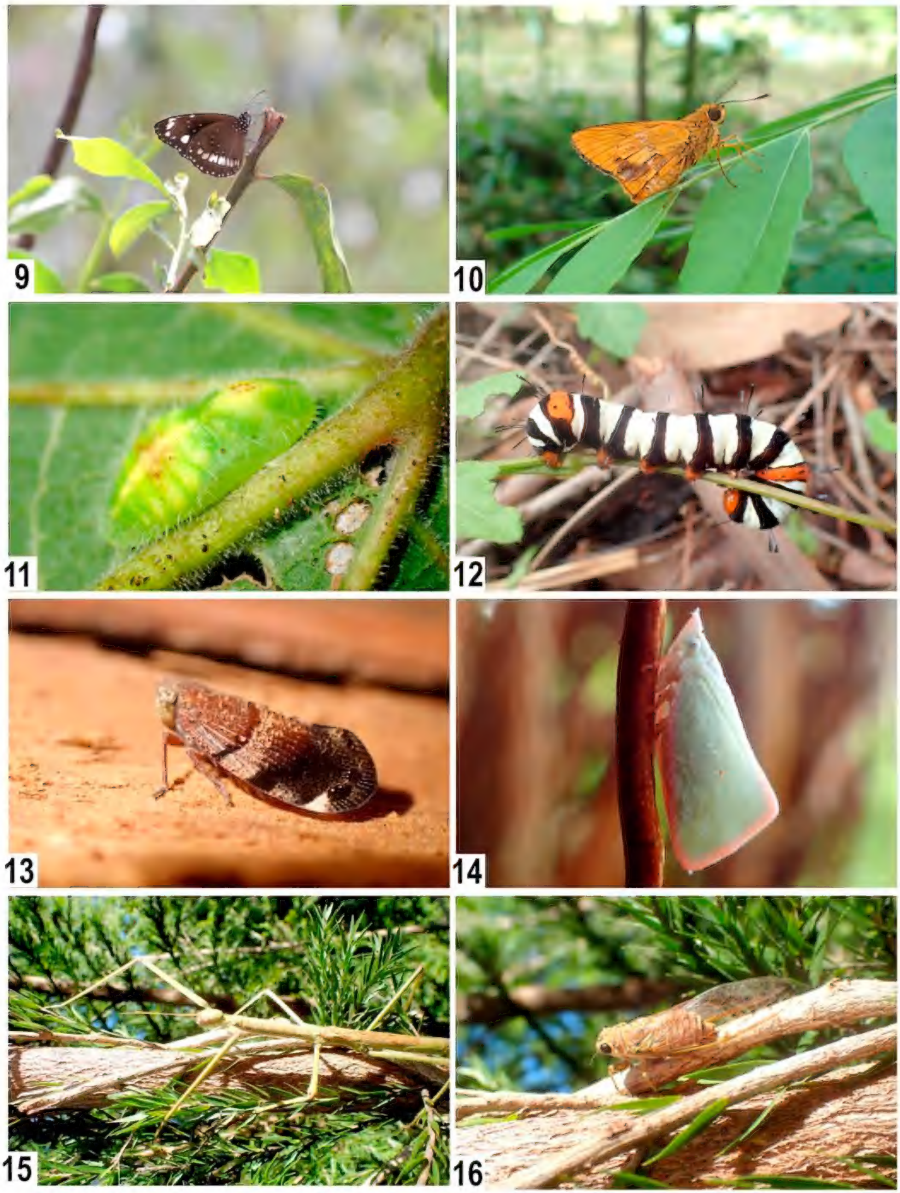
Geography and Flora

Brother's Gully is directly adjacent to the Brisbane River, a large tidal river, the source of which is at Wivenhoe Dam, and flows downstream out to sea in Moreton Bay. The river is highly sedimented giving it a dirty brown colour. The soils adjacent to the Brisbane River comprise clay in the damper low-lying areas, or schist and basalt in higher, drier areas. Thus, the geology of the region through which the river flows has shaped its flora. In the context of *Brother's Gully*, this area of lowland sub-tropical riparian forest contains a wide variety of unique plants species. These include Bunya Pine (*Araucaria bidwillii*), Hoop Pine (*Araucaria cunninghamii*), Flooded Gum (*Eucalyptus grandis*), Whalebone Tree (*Streblus brunonianus*), Steel-leaf Elm (*Aphananthe philippinensis*), Moreton Bay Fig (*Ficus macrophylla*), Tree Waratah (*Alloxylon flammeum*), Cluster Fig (*Ficus racemosa*), Queensland or Bopple-nut (*Macadamia integrifolia*), Love Flower (*Pseuderanthemum variabile*), Burny Vine (*Trophis scandens*), Lawyer Cane (*Calamus muelleri*) and Rose Apple (*Syzygium moorei*). Some of these species are now rarely observed naturally in these lowland riparian areas. The mangrove area adjoining *Brother's Gully* contains Grey Mangrove (*Avicennia marina*), Black Mangrove (*Avicennia germinans*) and River or Black Mangrove (*Aegiceras corniculatum*) which occur in the tidal zone of the riverbank. A little further away from the mangroves are found Swamp Lily (*Crinum asiaticum*), Moreton Bay Chestnut (*Castanospermum australe*), Weeping Bottlebrush (*Melaleuca viminalis*), Mangrove Fern (*Acrostichum speciosum*) and River Red Gum (*Eucalyptus camaldulensis*). These species are not often seen this far up the Brisbane River.

To increase animal species diversity, particularly the invertebrates and birds, we planted specific plant species that would attract these two groups, especially butterfly and beetle hostplants; the total in excess of 180 species. The most interesting plant species used in the regeneration work were Red Cedar (*Toona ciliata*), Stream Lily (*Helmholtzia glaberrima*), Norfolk Island Pine (*Araucaria heterophylla*), Kentia Palm (*Howea forsteriana*), Mission Beach Fan Palm (*Licuala ramsayi*), Walking Stick Palm (*Linospadix monostachyos*), King Fern (*Angiopteris evecta*), Norfolk Island Tree Fern (*Cyathea brownii*), Veiny Wilkiea (*Wilkiea huegeliana*), Queensland Bottletree (*Brachychiton rupestris*), Cunningham's Jute (*Corchorus cunninghamii*), Foxtail Palm (*Wodyetia bifurcata*), Strangler Fig (*Ficus watkinsiana*), Pepper Vine (*Piper hederaceum*) and the Marblewood or Rainforest Acacia (*Acacia bakeri*).

Invertebrate Fauna

Invertebrates were found to be the first animal group to arrive after commencing the regeneration work. Species already recorded in *Brother's Gully* prior to beginning the regeneration were generally common species, but in the mangroves, there were some unusual species already there such as Purple Rock Crab (*Leptograpsus variegatus*),



Figs 9-16. '*Brother's Gully*'. (9) *Euploea corinna*, (10) *Cephrenes augiades*, (11) *Philiris innotata* pupa, (12) *Agarista agricola* larva, (13-14) leaf hoppers Order Hemiptera, (15) *Anchiale austrotessulata*, (16) *Tamasa tristigma*.

Orange Fiddler Crab (*Uca vocans*), Mud Crab (*Scylla serrata*); all were common during low tide when mud was exposed. After rain, a small creek flows through the bottom of *Brother's Gully*, and here the Water Spider (*Megadolomedes trux*), Pond Skater sp. (*Aquarius*), Underwater Boatmen (*Corixidae*) and the Water Stick-insect. (*Ranatra* sp.) can be quite abundant especially after heavy rain. In the forest, in the canopy and on emergent layers, some common species already occurred, such as Common Crow (*Euploea corinna*), Eastern or Purple Crow (*Euploea tulliolus*), Small Green-banded Blue (*Psychonotis caelius*), Orchard Swallowtail (*Papilio aegeus*) butterflies, Tessellated Stick-insect (*Anchiale austrotessulata*), Golden-winged Mantis (*Tenodera australasiae*), Giant Orange Lacewing (*Nymphes myrmeleonides*), Eucalypt Longicorn (*Phoracantha semipunctata*), Hibiscus Bug (*Tectocoris diophthalmus*), Bee-killer Assassin Bug (*Pristhesancus plagipennis*) and Fig-leaf Beetle (*Poneridia australis*). The understorey in *Brother's Gully* is like most rainforests, filled with leaf-litter, rotting logs, rocks, and plants; this creates a perfect moist environment. Common species of the understorey already present prior to revegetation included Evening Brown butterfly (*Melanitis leda*), Cloudy Stag Beetle (*Ryssonotus nebulosus*) and Golden Stag Beetle (*Lamprima aurata*).

Since revegetation commenced, the following species of invertebrates have appeared: Lepidoptera - Leaf-wing butterfly (*Doleschallia bisaltide*), Orange Palm-dart (*Cephrenes augiades*), Chrome Awl (*Hasora chromus*), Botany Bay Diamond Weevil (*Chrysolopus spectabilis*), Titan Stick-insect (*Acrophylla titan*), Bladder Cicada (*Cystosoma saundersii*), Bottle Cicada (*Glaucopsaltria viridis*) and Tree-bark Assassin Bugs (*Reduviidae*).

Invertebrate Species of special note

The Cat's Claw Jewel beetle (*Hedwigiella jureceki* – was *Hylaeogena*) was introduced to the Moggill Creek Catchment as a biological control for Cat's Claw Creeper (*Dolichandra unguis-cati* – was *Macfadyena*). It has worked successfully as it has defoliated many plants and sometimes killing whole populations of the vine in various parts of *Brother's Gully*. Another special mention is the successful establishment of the Bordered Rustic butterfly (*Cupha prosope*) which is now often seen in the gully. Its bright forewings flash through the understorey and on the forest edges. Although not yet observed, characteristic borer holes in several dead Hoop Pines (*A. cunninghamii*) in *Brother's Gully* may be the result of Giant Hoop Pine Weevils (*Eurhamphus fasciculatus*). This quite large beetle is Australia's (and one of the world's) largest weevils. It requires large stands of Hoop Pines to survive, of which we have approximately 20 fully grown trees. The Brisbane Trapdoor Spider (*Arbanitis longipes*) is common on clay soils in the gully, with its distinctive trap doors often being seen around the bases of some trees. Finally, after our successful planting of various rainforest plants, including Richmond Birdwing Vine (*Pararistolochia praevenosa*), *Wilkea* spp., Laurels, *Brachychiton* spp. and Zig-zag Vine (*Melodorum leichhardtii*), perhaps one day may bring Richmond Birdwings (*Ornithoptera richmondia*), Regent Skippers (*Euschemon rafflesia*), Macleay's

Swallowtails (*Graphium macleayanum*), Tailed Emperors (*Charaxes sempronius* – was *Polyura*) and Four-barred Swordtails (*Protographium leosthenes*) to *Brother's Gully*.

Other vertebrate fauna present

Although this article is about the invertebrate fauna of Brother's Gully, I must mention some of our other incredible fauna present. Commonly observed species include Striped Marsh Frog (*Limnodynastes peronii*), Green-tree Frog (*Litoria caerulea*), Golden Water Skink (*Eulamprus quoyi*), Dark Bar-sided Skink (*Eulamprus martini*), Water Dragon (*Intellagama lesueurii*), Carpet Python (*Morelia spilota*), Green-tree Snake (*Dendrelaphis punctulata*), Rainbow Lorikeet (*Trichoglossus moluccanus*), Eastern Whipbird (*Psophodes olivaceus*), Bell Miner (*Manorina melanophrys*), White-headed Pigeon (*Columba leucomela*), Ringtail Possum (*Pseudocheirus peregrinus*) and Common Brushtail Possum (*Trichosurus vulpecula*). In addition, we have some unique and rare vertebrates, such as Tusked Frog (*Adelotus brevis*), Elf Skink (*Eroticoscincus graciloides*), Major Skink (*Egernia major*), Red-bellied Black Snake (*Pseudechis porphyriacus*), Powerful Owl (*Ninox strenua*), Mangrove Honeyeater (*Lichenostomus fasciogularis*), Black-breasted Button Quail (*Turnix melanogaster*), Woompoo Fruit Dove (*Ptilinopus magnificus*), Sugar Glider (*Petaurus breviceps*), Northern Brown-nosed Bandicoot (*Isoodon macrourus*) and Yellow-footed Antechinus (*Antechinus flavipes*).

I thank Ambrose Treacy College for the greenlighting of the project, and with their continued support that keeps this project going. In addition, I thank the Brisbane City Council for their generous grant which enabled the purchasing of plants and the removal of weed species, and Land for Wildlife and the Moggill Creek Catchment respectively for the designation of *Brother's Gully* property as Land for Wildlife and for a donation of plants. Finally, as I look back at the progress that has been realized, the plants I have planted, the species I have attracted and the trees that have been saved, I feel privileged to be a major part of this project.

Photos Alexander Davies

PRESIDENT'S REPORT TO 2019 AGM

The past year seems to have moved by quite rapidly and, with the support of our committee and several of our members, it has been quite a successful one. I wish to thank each of them personally.

Thank you, Richard, for your steadying role as Vice-President where it is good to know that you are there with your calm manner and great depth of experience.

Thank you, Rob, for your constant cheerful thoughts and actions and steady hand on the finances of our club.

Thank you, in absentia, Daphne, for always being there at the end of the phone line, or text or on email; for your constant stream of experienced ideas and comment; for your communication with your valuable group of contacts and members. This report will be included in the June edition of our flagship magazine - the 93rd edition. For 23 years, Daphne has patiently brought together information and articles to get our quarterly magazine out "on time". This is indeed a monumental achievement.

Dawn (with the quiet backup of Bernie) makes a great and frequent contribution to the smooth running of the club: agendas and minutes appear quickly and in detail; a constant stream of ideas and actions lead to the attendance of guest speakers at our meetings; promotional flyers etc appear frequently; out comes a club bookmark; meeting venues are sourced and booked well ahead; guest speakers arranged. The shirts with the BOIC logo which we wear today are a product of Dawn's creative brain.

John continues to contribute with his wealth of knowledge of invertebrates and plants - more later.

David is full of enthusiasm and ideas and is always there to help out in club activities.

Thank you to Ian and Judy Ferrier, Darren Shepherd of the EcoCentre, James Hansen, Ian Buddle, Alan and Judy Lovelock, Russel Denton and Chris Sanderson for support in our many activities and thank you to the many members who have contributed articles to our magazine.

Our quarterly meetings have been quite a success with quite a number of members and some visitors attending. The meeting of May 2018 was held here at the Karawatha Discovery Centre and was followed by an excellent talk on native bees by Tim Heard. Our meeting in August 2018, held at Griffith University, was quite a celebration with the presentation of prizes to winners in the club's inaugural student photo competition. Special thanks go to Darren Shepherd, Bernie Franzmann and Trevor Lambkin for their expertise on the judging panel. In November, David Exton opened our eyes to the world of jellyfish at our Downfall Creek Bushland Centre meeting. Finally, our highly successful February meeting at the EcoCentre at Griffith University was capped off with Chris Sanderson outlining the exciting upcoming Butterflies Australia Project.

Along the way, we managed to have an excursion to part of the Boondall Wetlands led by Russel Denton, a "Behind the scenes" visit to the Queensland Museum organised by Dawn and a trip to Mary Cairncross Park at Maleny led by Ian and Judy Ferrier.

Two major events enabled the club to reach out to a wide number of the people which is a major goal of the club. Our attendance at the two-day Native Plants Queensland spring flower show in September meant that we had contact with hundreds of people. Potted butterfly host plants sold well – we will welcome contributions for this year's

event. The World Science Festival was a challenging but rewarding exercise with a great team effort from all involved. Bernie kept a rough tally of the numbers visiting our site and the result was around 300 on Saturday and 600++ on Sunday. There will be a report in the June edition of our magazine

I confess that I am a bit of a novice when it comes to the operation of Facebook but Dawn, one of our page managers, says that we currently have 418 members. It is evident that many of these members have great interest and depth of knowledge of invertebrates. We would welcome contributions to our magazine so that their interest and knowledge is shared in the print medium.

The club publication "The Mistletoes of Subtropical Queensland, New South Wales and Victoria" continues to sell well. Back in November 2010, we printed 1000 copies of the third edition of our popular host plant book and there are now only a handful left. Today we release the fourth edition - but more of that later.

All indications are that the coming year will be an interesting and rewarding one.

ITEMS OF INTEREST

An Interest in Hawk Moths – *Carol* and *Trevor Deane*

My wife Carol and I both have an interest in hawk moths, the Sphingidae family. Mine began as a young boy growing up in the 1940's war-damaged London. Carol's began in the early 1960s when she met me, a young lad, who had recently migrated from the UK without his family, after completing his school education.

In those early years, we thought of ourselves as collectors, not conservationists as we have now been for most of our lives. Interestingly, it was the ability to buy an SLR Pentax camera at an affordable price from a tax-free Suva in 1965 that began that change for us. Colour photos replaced the need to kill moths to prove what we had found. Having an archival collection of lepidoptera as part of the Australian National Insect Collection is important for our nation but no longer do children need to learn that killing is necessary to build a personal collection. Today's digital cameras and phones are all that is needed to record one's observations. In educating the young we must emphasise the need for conservation for species survival. Increasingly humans are spreading their footprint on this earth and adding the risk of species extinctions by destroying habitats.

I do not hold a memory of how I discovered hawk moths in London but the thrill of finding both Lime Hawk Moths (*Mimas tiliae*) and Poplar Hawk Moths (*Laothoe populi*) as a child remains. These two species are true cold climate hawk moths resident in the UK and Europe and are able to breed in the often very cool summer weather conditions found there. Later, I also discovered the exciting Privet Hawk Moths (*Sphinx ligustri*) outside London to the east in Essex. This beautiful hawk moth

is both a resident and migrant from north-eastern Europe being most abundant along the UK eastern and southern coastal areas.
Living on Sydney's north shore in the early 1960s we began finding Australian Privet Hawk Moths (*Psilogramma menephron*) feeding on Privet (*Ligustrum*) hedges in Artarmon and on Lilac (*Syringa vulgaris*). Whilst the larvae were big like the European Privet Hawk Moth, they were very different in aspects of colour and dorsal horn shape. And after breeding one through to the perfect insect I discovered the adult moth did not resemble the Privet Hawk Moth I had come to know in the UK. In fact, most Australian hawk moths, I soon learned, were new to me.

Around this time in the late 1960s, we learned of the Entomological Supply business being conducted from a private home in St. Leonards, near Artarmon, where Carol and I lived, on Sydney's north shore. Here we first met Max Moulds who many will know as the leading authority on Australian hawk moths as well as cicadas. At that time in the 1960s, well before the internet, I asked Max was there a hawk moth book we could purchase. He said not to his knowledge but he hoped to write one – after he wrote the cicada book! Fifty years later, Max, along with Jim Tuttle and David Lane, has finally got the proofs of a book on Australian hawk moths to CSIRO Publishing and, hopefully, it will be on our bookshelves by the end of 2019. For anyone who finds these beautiful insects exciting, we feel sure this book will answer any questions and open new doors to the wonders of the Sphingidae family. In addition to detailed life history text, we understand the book will provide many pages of coloured photos showing the life cycle of each species with the exception of those where the larval food plants remain unknown and larvae have never been found. Now there is a challenging task for all budding hawk moth enthusiasts!

Ambulyx dohertyi One of two *Ambulyx* species from FNQ. Their larva and foodplant are unknown.

Some background to complete the picture: For Carol and me, saving towards buying a home and then rearing a family whilst we both worked, sadly meant little butterfly and moth observing took place during the period 1966 to 2000. Partial retirement in 2001 opened the door to again spend time on citizen science projects like looking for the Australian Fritillary butterfly (*Argynnis hyperbius inconstans*), working with OEH (Office of Environment and Heritage) in NSW and a group of conservationists for five years, without success. We also spent time as a group searching for the Southern Pink Underwing Moth (*Phyllodes imperialis smithersi)*, in Mid-north and Northern NSW and recording our findings and photographs on a website. Excitingly, the Group discovered that this moth is more common than initially thought, and we again began

searching for hawk moths. (See www.southernpinkunderwingmoth.com)

In recent years we have added our interest in hawk moths to our Dorrigo Butterfly Garden website. It covers species found on our property as well as other places in NSW and Qld. We have found 44 of what we believe to be Australia's 65 hawk moths, but the forthcoming book will set the current benchmark for the known number of species and we hope for some positive surprises.

For us, breeding Australian hawk moths has been an exciting experience discovering new information on our journey. With limited Australian hawk moth information available, prior to the change brought about by the internet in more recent times, the knowledge base for everyone has taken time to grow.

Some aspects of hawk moth life history follow. Their eggs resemble each other across nearly all Sphingidae species, being spherical, green, smooth and shiny and approx. 1mm diameter. There are small differences in size with some of the larger species strangely having slightly smaller eggs. All hawk moths deposit their eggs on the underside of their particular larval food plant leaves. Usually, eggs are laid singly but occasionally two or three eggs will be laid in close proximity. Hawk moth larvae are immediately identifiable by the dorsal horn that protrudes from their tail end. Whilst this harmless horn remains throughout their five instars it can change shape slightly in different instars. There are two exceptions to the hawk moth larvae having five instars and a dorsal horn with both the Double-headed Hawk Moth (*Coequosa triangularis*) (3 & 4) and the Eucalyptus Hawk Moth (*Coequosa australasiae*) thought to have more instars in certain circumstances and both being devoid of a dorsal horn. Both moths are thought to spend extended periods in their larval stage far beyond most hawk moth larvae.

Coequosa triangularis (Double-headed Hawk Moth) A large hawk moth

(Double-headed Hawk Moth larva) We have recorded them living for 9 months. They were given the name triangularis as their head has a triangular shape.

The majority of hawk moth larvae feed throughout their lives by eating from the edge of their food plant leaves whilst sitting on the underside. Some who feed on plants with soft leaves like *Alocasia*

brisbanensis (Cunjevoi) and *Cayratia clematidea* begin feeding by eating small holes within the leaf before later switching to edge of leaf feeding. The Tryon's Hawk Moth (*Theretra tryoni*), the Yam Hawk Moth (*Theretra nessus*) and the Pale Brown Hawk Moth (*Theretra latreillii*) are species that fall into this category. Little is known of the native food plants of the common Scrofa Hawk Moth, (*Hippotion scrofa*) that also feeds on a number of exotic garden plants. We discovered a new native foodplant when we found *H.scrofa* larvae feeding on *Galium leicocarpum* (Bedstraw) a small herb with tiny leaves barely large enough to hold a hawk moth egg. The larvae we discovered were not on the food plant but were concealed, sitting on other ground cover plants nearby.

Hippotion scrofa (Scrofa Hawk Moth)
The larvae are difficult to find when feeding in low growing herbs.

Hawk moth larvae are various shades of yellow-green when they first emerge from their egg, with their dorsal horn often seeming very long for their small size. Their first food after entering the world will be to devour most of their eggshell. Most hawk moth larvae will remain green in colour through to at least their third instar. Then in the fourth or fifth instar, some species change colour from green to brown, others to black or a shade of pale red/brown or yellow/orange. In addition to their basic colour, many larvae have forward sloping coloured stripes on their sides and some have eye-spots. Together with a knowledge of overall colour variations, these stripes and eye-spots, where they exist, are keys to quick identification of the larva you encounter in the field.

Theretra oldenlandiae (Impatiens Hawk Moth)
A black larva with beautifully coloured eye spots and the ability to wave its dorsal horn as it walks.

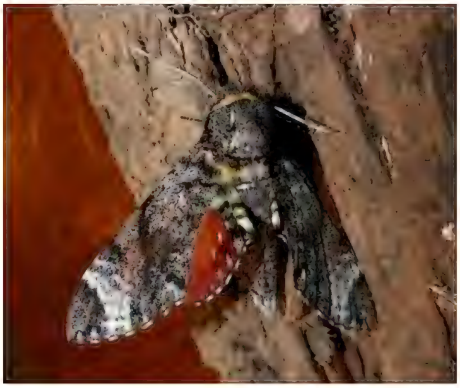
To see all the species we have found in their natural pose you can go to our website:

http://butterfliesdorrigo.weebly.com/hawk-moths-gallery.html

Holding the cursor over each photograph in our hawk moth gallery will display the species name. If you then click on the photograph, it will take you to a far more detailed page covering that species. That page shows the photos we have of that species (crediting the photographer if not us) and data of sightings, food-plant, and any interesting information.

Cizara ardeniae (Coprosma Hawk Moth)
It is a beautiful velvet green.

The green form larva feeding on
Coprosma repens, a NZ native.



Tetrachroa edwardsi (Parsonsia Hawk Moth)
flashing its beautiful russet hindwing

We are always interested to hear from others with id questions, sighting information, food plants, etc. and are happy to do all we can to help these lovely moths have a more secure future.

Photos Carol and Trevor Deane

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Amendment to the article "Common Imperial Hairstreak (*Jalmenus evagoras evagoras*)" – *Peter Hendry*

In an email to the editor, Martyn Robinson pointed out an error in my observations of the Common Hairstreak republished in the last issue of Metamorphosis Australia, Issue No. 92. The email reads as follows: *Just read the articles on the hairstreaks and noted that the second article says the author could not understand why the ants were attending the pupae with no possible reward. This is an example of assumption without checking - both larvae and pupae are studded with perforated cupola organs which produce the sweet secretions - not only that but late-stage larvae and the pupae stridulate to communicate with each other and the ant hosts - presumably to keep their protectors near and to synchronise hatching. The eggs and younger stage larvae are the most vulnerable as they produce so little secretion so on hatching the larvae*

try to find either older larvae to associate with or, failing that, tree hoppers of a species which also secretes honeydew of some kind. The following is one of several references on the multiple glands of multiple stages.
https://piercelab.oeb.harvard.edu/files/pierce/files/1999_pierce_and_nash.pdf

I would like to thank Martyn for pointing out my error and teaching me one of life's lessons "assumption without checking" or as I will remember it, if it looks wrong look harder. Thanks Martyn.

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Schools and Butterflies – *Dave St Henry*

Having a butterfly garden at school often brings pleasant surprises. Young kids have a pretty keen eye when they realise a grub could become a beautiful butterfly. Last year, I was brought in 3 larvae that seemed like a Skipper and ended up being a Banded Awl! Other times I am left dumbfounded like the time a year 2 girl brought in a 'Varied Eggfly' in a glass jar. I have tried really hard but been pretty hopeless at getting a female Varied Eggfly to oviposit but this one had laid about 100 eggs on an exotic plant! I was able to raise about 75 adults and it was a joy for the classes to observe this. Interestingly, the first 15 butterflies to emerge were males, then over the next 10 days, the balance slowly went in the completely opposite direction with nearly all females emerging at the end. (I have heard that males need time to mature – I think this could be true in all creation!) I have included a couple of photos of some beautiful female variants. Photos Dave St Henry

Whiteflies in Nielsen Park, Eastern Suburbs, Sydney, NSW –

Irene Denton

Note: most of this article originally appeared in The Society for Insect Studies Circular 194, August 2018.

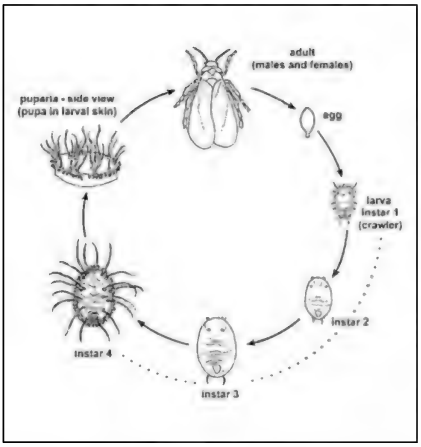
I'm a member of the Society for Insect Studies in Sydney. We had a nice field day on 30 June 2018, to Nielsen Park, adjacent to Sydney Harbour. It was a fine winter day and there were enough insects, and a variety of other fauna, plus flora and fungi to make it satisfying from a nature point of view.

At the end of the day, three of us went to Mt. Treflo within the park, where Gary Harris found an odd substance underneath some leaves. The informative internet says it was a Whitefly colony and the "hairs" are waxy filaments attached to the instars.

There are about 1,550 species of Whitefly worldwide, in family Aleyrodidae, part of the plant-sucking Homopterans including aphids, mealybugs and scale insects. The name Whitefly comes from a whitish waxy coating on their wings, though some Whiteflies are black and then the common name of Blackfly may be used.

Only a few Whitefly species are pests in crops and greenhouses (fruit, vegetables, ornamental plants and flowers) due to the transmission of plant diseases, plus production of honeydew which results in fungal mould damaging the plant leaves and fruit. The pest species vastly dominate internet search results with lots of information coming from government and university departments of agriculture.

The lifecycle comprises the eggs (no male required!), laid in circular, arc or horseshoe patterns, and sometimes randomly. Instars comprise the first stage ("crawlers" as the only moving instar), and two more immobile instar stages. The fourth and final instar stage eats for a short time, then stops feeding and develops a skin that is sometimes referred to as the pupa as it is from this stage that the adult emerges. Total cycle is dependent on temperature and ranges from 14 to 39 days.



They are very productive, with up to 12 generations throughout the year.

The adults are up to 2mm in body length, and 3 mm in wingspan (some giant whitefly species are up to 9mm), with four wings. They live up to 24 days.

The instars (also termed nymphs) are tiny, flattish, oval-shaped discs. Some produce the extraordinary wax filaments to try and protect themselves against predators such as wasps, spider mites and beetles, lacewings, ladybirds and thrips.

Identifying Whiteflies to species level can be done from eggs, but these are tiny (sometimes less than 1 mm long and requiring a microscope). Similarly, species differences in the adults are mostly microscopic. Therefore, it may be easier to use the pupa case, which has a marginal fringe and some have the wax filaments, the structure of which may be unique to some species. Additionally, there are species-specific arrangements of compound pores, spines, siphon tubes and ridges, if you have a microscope and an afternoon to while-away on this.

I didn't see a Whitefly when looking with unaided eye or when doing the photography, but zooming in on one my photos actually showed one unhidden on a leaf, plus at least seven others amongst the filaments. This is the magic of photography and zooming in using image software.

I've never seen these waxy filaments before so it was a highlight for me. The instars and adults are tiny to very small. However, the waxy scales surrounding the eggs, and the waxy filaments from the instar stages, are visible enough, if you look under leaves like Gary did.

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(1) Internet information: Department of Agriculture, Government of Western Australia; Wikipedia; and in USA: California Strawberry Commission; University of Arizona; Texas A&M University System; John P. Sanderson, Cornell Cooperative Extension.
(2) Line drawing of Whitefly lifecycle - Thanks to Darren Ward, Landcare Research, New Zealand (nzacfactsheets.landcareresearch.co.nz/ factsheet/InterestingInsects/ Cabbage-whitefly Aleyrodes-proletella.html).

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Out-of-Sight and Out-of-Mind – Insects Suffer Most from Inappropriate Fire Regimes – *Don Sands*

Abstract

Detrimental effects on insect biodiversity from fuel reduction burning of bushlands have only recently been recognised, for example by New *et al.* (2010), but the different impacts of fires on insects, when compared with impacts on plants, have rarely been recognised, accepted or understood (Croft *et al.* 2018). New *et al.* (2010) focussed on impacts of the scales, frequencies and seasons when fires were deliberately lit for fuel reduction, and importance of retaining unburnt refuges enabling recolonisation of insects from unburnt habitats. A better understanding of deliberately-lit fires on insects needs to recognise they are part of the overall biodiversity of all animals (Ca> 75%) and their interactions with plants affect the survival of plants. Sands (2018) pointed out that unless insects shelter underground, under bark, logs or rocks, insects cannot survive burning of their habitats, and while some can avoid fires in this way, the majority can only survive if sufficient food is available afterwards. For example, phytophagous insects that survive fires above ground (e.g. Lepidoptera) without food, must suspend development, enter aestivation or diapause phases to bridge the time required for regrowth of their plant hosts. For insects that shelter underground threats from fires are far less of concern, for example when fuel reduction burns were carried out at habitat of the Eltham Copper butterfly (*Paralucia pyrodiscus lucida*) in Victoria, larvae sheltering underground with ants survived (New 2014). For others that escaped and later returned, live plants are needed and most insect pollinators, predators and parasitoids will starve or fail to reproduce awaiting regeneration.

Fuel reduction burning of bushlands in the cool, dry months is mostly practiced in Australia but the seasons chosen often coincide with periods of dormancy in insect stages, and their inability to escape or to find shelter, for example, winter-active

insects such as oecophorid moths with larvae that are dependent on dead leaves. The vulnerability to fires of these moths becomes critical and losses affect the recycling of nutrients, and without them, leaf litter builds up and fuel loads increase. Rising threats now occur when habitats are over-run with flammable, exotic grasses. In particular the African grasses (Sands *et al.* 2015) become highly flammable when drying out in winter and spring, and at a time when fuel reduction burns are most often conducted. Regrowth after fires of exotic grasses competes for light and space which prevents native plant regeneration and replaces the food plants for insects. Micro-mosaic patch burning methods, based on those used traditionally by aboriginal communities, can greatly reduce the risks to biodiversity when plant communities need burning for fire breaks (Sands & Hosking 2005), but there is need to recognise the seasons and soil moisture needed for plants to regenerate and for seedlings survival. Such methods promoting Gouldian finch conservation in Western Australia, minimise impacts on all small birds, their food and nesting sites, and are amenable for management of insect habitats, pollinators, and providing food for other organisms and symbiotic interactions.

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The Bermuda Buckeye, *Junonia coenia bergi* (Lepidoptera : Nymphalidae) – *Peter Hendry*

On the 17th January 2019 I stepped ashore on Ireland Island, Bermuda and started exploring the island. After visiting the nearby shops and tourist spots I walked further

afield. Crossing the bridge which joins Ireland Island north to Ireland Island south, I took a right hand turn down a dirt road onto a flattened area covered in grasses and low growing vegetation. It was here that I noticed several specimens of a nymphalid butterfly basking in the sunlight. I was fortunate to capture a reasonable image (Fig. 1) and recognized that it had to be related to our Meadow Argus, *Junonia villida* Fabricius, 1787 (Fig. 2).

Fig. 1

Fig. 2

My subsequent research showed it to be the Bermuda Buckeye, *Junonia coenia bergi,* Avinoff, 1926. The subspecies was named after B. Berg who accompanied A. Avinoff when they collected thirty one males and twelve females on the Bermuda island of St George in July 1924. The type male and the allotype female were illustrated (Fig. 3) along with the original description in the Annals of the Carnegie Museum Vol XVI.

Fig. 3

Avinoff noted *J. coenia bergi* differs from the typical form*, J. coenia coenia*, recorded from, eastern North America, Cuba and the Bahamas, in being smaller in size, contrasting in colour; the whitish band on the front wings of a purer colour; ground-colour dark brown, with the orange-russet well developed eyes on the hind wings big and well defined. Melissa J. Peters & Jeffrey M. Marcus (2016) in a mitochondrial genome study found that excluding ambiguous nucleotides, *J. coenia bergi* is 99.1% identical (with only 0.15% barcode divergence) to *J. coenia coenia*.

A further study by Melissa J. Peters & Jeffrey M. Marcus (2017) showed *J. coenia bergi* does not meet the criteria for full species designation, but geographic isolation, morphological distinctiveness, and cultural importance suggest that it remain recognised as a subspecies of *J. coenia*; while a third subspecies, *J. coenia grisea*, Austin & Emmel 1998, recorded from, California, Mexico, Oregon, Nevada and Arizona, may meet the criteria for full species status.

Wikipedia (*https://en.wikipedia.org/wiki/List_of_Lepidoptera_of_Bermuda*) lists sixteen species of butterflies as having been recorded on the islands of Bermuda of which only 8 or 9 are known to breed on the islands and the Bermuda Buckeye is the only endemic taxon. Of the other 7 species of nymphalidae that have been recorded in Bermuda, *J. coenia bergi* most closely resembles the American painted lady, *Vanessa virginiensis* (Drury, 1773); from which it is easily distinguished by the large eye spots on both fore and hindwings. *V. virginiensis* only has a post medial row of small eye spots on the hind wing.

While Bermuda may be more famous for the Bermuda Triangle than the Bermuda Buckeye it gave me great pleasure to see the Buckeye in the wild and I can say I safely traversed the Bermuda Triangle.

Note: at the time of writing this article I do not have the full data for the imaged *J. villida* (Fig. 2) apart from the fact it is from mainland Australia.

Thanks are given to Kelvyn Dunn who reviewed and made suggestions for improvements to this article.

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Peters, Melissa J. & Marcus, Jeffrey M. (2016) *The complete mitochondrial genome of the Bermuda buckeye butterfly Junonia coenia bergi (Insecta: Lepidoptera:Nymphalidae)*, Mitochondrial DNA Part B, 1:1, 739-741, DOI: 10.1080/23802359.2016.1159929 (http://dx.doi.org/10.1080/23802359.2016.1159929)

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Life history notes on the River-sand Grass-dart, *Taractrocera dolon* (Plotz, 1884) Lepidoptera: Hesperiidae - *Wesley Jenkinson*

The River-sand Grass-dart (previously known as the Small Yellow Grass-dart) is recognised as two subspecies in Australia. One subspecies (*T. dolon dolon*) is encountered very sporadically along the coastal and sub-coastal regions of Queensland and northern New South Wales. The second subspecies (*T. dolon diomedes*) is known from the north western area of the Northern Territory (Braby, 2000).

This species is considered uncommon and very localised. It is chiefly located in eucalypt open forest with a grassy understorey where the host grasses are established. Braby 2000 states that "the life cycle and habits of the immature stages and adults are poorly known" and "Adults have been recorded intermittently between September and March in north-eastern Qld".

Adults can easily be confused with other *Taractrocera* and *Ocybadistes* grass-dart species. Within these two genera, *O. walkeri* and *O. flavovittata* in particular being very similar in size and appearance. *Taractrocera* species can generally be separated from *Ocybadistes* species by having a club shaped antenna with a more rounded apiculus [see images]. Adults are slightly smaller than *T. ina* and *T. anisomorpha* and generally have an additional spot on vein Rs and M1 on the upperside of the hindwing. In general grass-darts can be difficult to identify. Where in doubt it is preferable to retain voucher specimens for accurate identification when recording species lists.

Taractrocera dolon antenna

Ocybadistes walkeri antenna

Males can be separated from females by three very inconspicuous sex brands on the upperside of the forewing. Wing termens of the females are slightly more rounded and the upperside orange markings of some specimens may be slightly reduced giving them a darker appearance.

Individual specimens of *T. dolon* show slight variation in the size of the orange markings on the upperside.

Adult flight is typically very rapid and while basking they settle in a 'skipper' pose with their wings open, facing towards the sun, revealing the upper side markings [see photo adjacent of basking female]. Males can be observed strongly defending open glades, chasing off other males and typically returning to the same perching spot on grass stems (often with seed heads) and occasionally they settle on sandy gravel. The females also frequent the same areas looking for suitable ovipositing sites. The males do not appear to specifically hilltop, however

both sexes can be located along grassy ridges and hilltops. Adults are readily attracted to small native and exotic flowers. Whilst feeding the wings may be open or closed. During cloudy conditions they settle on grasses with their wings closed.

Wingspans for the pictured adult specimens are: males 20mm and females 20mm.

Taractrocera dolon dolon **(River-sand Grass-dart)**
Images left to right: male, female, male underside, female underside

A female collected in November 2018 from a private property near Hillview south of Beaudesert in South-east Queensland laid several eggs in captivity. The eggs were laid singly on several grass species supplied. Egg laying was not observed. These eggs were successfully raised through to full size adults in captivity on a mix of available soft shade grown grasses, chiefly Green Couch (*Cynodon dactylon*), and exotic grasses Johnson Grass (*Sorghum halepense*) and *Paspalum dilatatum*. The small larvae preferred *C. dactylon* but larger instars also fed on a mix of the three species offered. Green Panic (*Megathyrsus maximus*) was also offered but larvae rarely chewed this species. Further observation at this site is required to confirm the natural host species, as native host grasses still appear to be unknown.

Another exotic grass species, *Sorghum verticilliflorum* from near Ingham in North-east Queensland, has also been recorded as a host (Dunn and Dunn 1991 in Braby 2000).

Freshly laid egg

2 day old egg

The eggs were 0.9mm wide x 0.6mm high, smooth, dome shaped, white when laid, with pinkish red apex and broken lateral markings appearing after 2 days. It was noted that *T. ina* and *T. anisomorpha* eggs remain uniform colour not forming pinkish red markings throughout their duration.

Five first instar larvae emerged between 6.30 am and 8.30 am and soon consumed all of their eggshells. The larvae on *C. dactylon* created shelters towards the apex of the leaves by stitching silk threads across a leaf and tensioning the silk to roll the leaf edges in towards the centre. The open-ended shelters were then later lined with silk and were slightly longer than the length of the larva. When resting in the shelters the heads were facing upwards. The early instar larvae consumed small sections from the outer edge of the leaf, towards the apex of the leaf and also below the shelter.

Larvae fed chiefly at dusk, but in captivity were also observed feeding during daylight. Larvae were rather active when disturbed and difficult to coax out of their shelters moving their heads from side to side rapidly. In contrast *T. anisomorpha* larvae being raised at the same time were extremely sluggish when disturbed. Each larva created several shelters as they grew in size, stitching several leaves together.

The larvae completed five instars and attained a length of up to 22 mm.

1st instar larva

2nd instar larva

3rd instar larva

4th instar larva

5th instar head capsule

5th instar larva

Pupal shelter

Pupa dorsal view

Pupa lateral view resting in shelter

Pupae, measuring 12mm in length, were located in closed silk-lined final shelters. Interestingly, of the several pupae examined the cremaster did not appear to be attached to the shelter with silk and lacked any surface white waxy powder often associated with Hesperiidae pupae.

First adult to emerge had an egg duration of 6 days, larval duration was 35 days while pupal duration was 5 days with the final adult emerging 13 days later.

De Baar & Johnson (1980) stated that a larva collected from Cape York Peninsula during the dry season in late June remained in a prepupal state for about two months before pupating with subsequent emergence of a male in early October. Braby (2000) commented "The significance of this dormancy period and its possible relationship to the annual drying of grasses would make an interesting study."

Locally, within the new boundary of the Scenic Rim Regional Shire south of Brisbane, I have records of adults from late November until mid-December and March. John Moss has early December specimens from Capalaba southeast of Brisbane and early January specimens from the Darwin region.

The emergence of this species possibly relies on significant rainfall, particularly in spring after the dry season. It is possible adults may also be on the wing earlier in spring and later in autumn in this region depending on local rainfall. Based on current observations, there are most likely two generations per year in the Scenic Rim region.

Acknowledgements: I would again like to thank John Moss for his suggestions on the manuscript. Photos Wesley Jenkinson

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New host plant for *Syntherata janetta* (White, 1843) with notes on other host plants and the current status of the family Saturniidae in Australia (Lepidoptera : Satuniidae) - *Peter Hendry*

Fig. 1

At the recent annual general meeting of the Butterfly and Other Invertebrates Club, Lois Hughes brought along a larva (Fig. 1) she had found feeding on a species of *Macadamia* on her property at Mt Cotton, Redland City, S.E.

Queensland. Collectively it was obvious to John Moss, Richard Zietek and myself that this was a species of Saturniidae but which one. The three of us, who all reside in Redland City, were aware of four species of Saturniidae in Redlands. I have collected *Austrocaligula eucalypti* (Scott, 1864) and *A. loranthi* (T.P. Lucas, 1891) at my place and have had *A. eucalypti* come to light at John's. Richard has collected *A. helena* (White, 1843) at his place and I have a specimen of *Syntherata janetta* (White, 1843), collected by Lois from her place, in my collection. We discounted *A. loranthi* as it is only known to feed on Mistletoe in the family *Loranthaceae* and the jump from *Loranthaceae* to *Proteaceae*, the family *Macadamia* resides in, seemed too much. Without any references on hand we left it at that, while I, having read Lane, Edwards & Naumann, 2010, remembered the importance of the colour of the scoli[1] as a diagnostic tool and noted those on Lois's specimen to be green.

Once home, I googled Saturniidae, Macadamia and found an article by Fernando Hernández-Baz, Jorge M. González, María Carmen Núñez Camargo, Ángel E. Núñez Sánchez and Gerardo Castro Bobadilla, 2018, in which they described *Macadamia integrifolia* as a new host plant record for *Automeris zozine* (Druce, 1886), a Satueniidae from a Cloud Forest at Veracruz State, Mexico but nothing on any Australian species of Saturniidae feeding on *Macadamia*. During a search of Bjørn M. Fjellstad's, Aus-Lep website I found images of all five larval instars of *A. eucalypti* and *S. janetta*. None of the larval instars of *A. eucalypti* had green scoli while on instar four and five of *S. janetta* they were green. A quick check of Don Herbison-Evans website, Caterpillars of Butterflies and Moths in Australia, showed the *A. Helena* larvae with reddish, purple or blue scoli. I then referred to Lane, Edwards & Naumann, 2010, which confirmed the fourth and fifth instar of *S. janetta* as having green scoli.

A few days later I went to Lois's place and photographed her specimen, during which time she informed me it had since shed its skin. The scoli were still green, this pointed to it as now being a fifth instar of *S. janetta* larva. On returning home I decided to contact David Lane and ask his opinion and what he knew of Saturniidae on *Macadamia*. David was quick to reply with "*Thank you for your mail and photos - the larva certainly appears to represent a fifth instar Syntherata janetta, and the record of Macadamia as a host plant is new for Syntherata and Opodiphthera. Other Australian genera also have not been recorded on Macadamia, and life history data is so far unknown for Neodiphthera species*".

Other known host plants of *Syntherata janetta*: Due to the history of *S. janetta* , this is not a straight forward subject. During the mid to late nineteenth century several species of *Syntherata* were named from Australia however, for most of the twentieth and into the twenty first century, these were all considered to be synonyms of the one variable species *Syntherata janetta*. Lane, 2003, described a new species from north Queensland, *Syntherata leonae*. Lane, *et al.* 2010, described three new species, *S. escarlata*, *S. mirata* and *S. pseudescarlata* and reinstated *S. melvilla* (Westwood,

1853), to species status from its synonymy with *S. janetta* while maintaining *S. disjuncta* (Walker, 1865), *S. insignus* (Walker, 1869) and *S. weymeri* Maassen, 1873 as synonyms of *S. janetta*. In regards to *S. janetta*'s distribution Lane, *et al.* 2010, states "*The species is presently known to occur in coastal south eastern Queensland from about the Gympie district, south through to as far as Como West in New South Wales*", so many older records of host plants may not apply to *S. janetta*. In Table 1, I have placed three lists of host plants for *S. janetta*, one from the British Natural History Museum web site, one from Common, 1990 and one from Don Herbison-Evans web page. I have immediately dismissed the records of *Eucalyptus deglupta* and *E. robusta*, noted as being records from New Guinea, as *S. janetta*, Lane *et al.* 2010, (based on Naumann, Lane & Löffler, 2009) does not occur in New Guinea. However, Ethan Beaver (pers. comm.) notes in captivity they take *Eucalyptus*, though he has never found them on *Eucalyptus* in the wild.

TABLE 1 – Red text doubtful, Green text confirmed.

Natural History Museum, UK	Common, 1990	Don Herbison-Evans
Aegiceras (Myrsinaceae)	*Aegiceras* (Myrsinaceae)	
		Alphitonia obtusifolia (Rhamnaceae)
		Avicennia marina (Acanthaceae)
Ceriops (Rhizophoraceae)	*Ceriops* (Rhizophoraceae)	
		Cinnamomum camphora (Lauraceae)
Citrus (Rutaceae)	*Citrus* (Rutaceae)	*Citrus* (vaious) (Rutaceae)
Eucalyptus deglupta (Myrtaceae)		*Eucalyptus deglupta* (Myrtaceae)
Eucalyptus robusta (Myrtaceae)		
Euodia (Rutaceae)		
Geijera (Rutaceae)	*Geijera* salicifolia (Rutaceae)	
Glochidion (Phyllanthaceae)	*Glochidion ferdinandi* (Euphorbiaceae)	*Glochidion ferdinandi* (Phyllanthaceae)
	Melicope elleryana (Rutaceae)	
Olea (Oleaceae)	*Olea europaea* [olive] (Oleaceae)	*Olea europaea* (Oleaceae)
Petalostigma (Euphorbiaceae)	*Petalostigrna quadriloculare*	

	(Euphorbiaceae)	
		Planchonia careya (Lecythidaceae)
Podocarpus (Podocarpaceae)	*Podocarpus spinulosus* (Podocarpaceae)	*Podocarpus spinulosus* (Podocarpaceae)
Psidium (Myrtaceae)	*Psidium guajava* [guava] (Myrtaceae)	
		Rhizophora stylosa (Rhizophoraceae)
Schinus (Anacardiaceae)	*Schinus molle* (Anacardiaceae)	*Schinus molle* (Anacardiaceae)
Terminalia (Combretaceae)	*Terminalia* (Combretaceae)	
Timonius (Rubiaceae)	*Tirnonius rumphii* (Rubiaceae)	*Timonius rumphii* (Rubiaceae)

In the following text, the records in blue are confirmed by breeders but not listed in Table 1.

Lane, *et al.* 2010, included *Neolitsea australiensis*, and to a lesser extent *N. dealbata* as host plants for *S. janneta* as well as a Murdoch De Baar 1987 record on River or Black Mangrove (*Aegiceras corniculatum*) at Long Pocket, Brisbane. Steven Dodge, on the BOIC Face-Book page, has been raising *S. janetta* larvae at Nowra NSW, on Celery Wood, *Polyscias elegans* (Araliaceae), Pepper tree, *Schinus molle* (Anacardiaceae), Camphor Laurel, *Cinnamomum camphora* (Lauraceae) and Lemon tree, *Citrus limon* (Rutaceae). Bjørn M. Fjellstad on his web site, states "*I have reared this species successfully on both Billy Goat Plum (Planchonia careya) and Pepper tree (Schinus terebinthifolius). Even switching back and forth between the plants according to what is available in the area (as I sometimes have to bring the larvae with me when travelling), has never been a problem*". Ethan Beaver (pers. comm.) has raised *S. janetta* from northern NSW on Lantana (*Lantana camara*) and Grey Mangrove (*Avicennia marina*), and in captivity found they take *Citrus* (lemon) and Strawberry Guava (*Psidium cattleianum*) and even *Eucalyptus* as stated above. Much of the information on the Web regarding *S. janetta* is pre Lane, *et al.* 2010, and includes distributions and host plants relating to its previous status as the one and only Australian *Syntherata*. *S. janetta* is truly polyphagous[2] and those unconfirmed records in this study may well prove to be correct.

Current status of the family Saturniidae: During my research, I remembered a mention of name changes in the Saturnidae on a Face-Book page dealing with Indo-Pacific moths. The paper involved was by Dr. Ronald Brechlin, 2005, in which he states "*the following taxa from Australia should also belong in Neodiphthera: N. saccopea (Turner,1928) comb. nov., N.excavus (Lane, 1995) comb. nov. and N. rhythmica (Turner, 1936) comb. nov. I place the following Australian species in*

the genus Austrocaligula: A. helena (White, 1843) comb. rev. (type species), A. eucalypti (Scott, 1864) comb. rev., A. loranthi (Lucas, 1891) comb. rev. and A. engaea (Turner, 1922) comb. rev. In the genus Opodiphthera sensu Wallengren, I retain only the following three species: O. astrophela Walker, 1855 comb. rev., O. fervida Jordan, 1910 and O. jurriaansei van Eecke, 1933" (from Indonesia).

Edwards, 1996 in the Checklist of the Lepidoptera of Australia states, "*The generic position of some Australian species is in some doubt and the relationship with some Oriental genera are unclear*".

I noted that the Australian Faunal Directory still has the old relationships on their web page while the Barcode of Life, BOLD web site, has moved the relevant taxon to agree with Brechlin, 2005. I put this conundrum to David Lane who replied in part, "*my advice would be that in any upcoming discussion or publication you would be obliged to follow Brechlin's current treatment of the Australian fauna.* --- (this work) *is lacking a great deal of primary information.* --- *The Australian saturniid fauna is in need of a thorough revision, and this subject is part of an ongoing research process between myself, Max Moulds, Stefan Naumann and Ted Edwards*". So further changes can be expected.

TABLE 2 – Comparison of the generic positions of the Australian Saturniidae from the 1996 Checklist to their current position based on Brechlin, 2005. Those species with authors included were named after the publication of the Checklist.

Checklist	Current
Attacus wardi	*Attacus wardi*
Coscinocera hercules	*Coscinocera hercules*
Neodiphthera sp. A	*Neodiphthera sulphurea,* Lane & Naumann, 2003
	Neodiphthera territorialis, Lane & Naumann, 2013
Opodiphthera astrophela	*Austrocaligula astrophela*
Opodiphthera engaea	*Austrocaligula engaea*
Opodiphthera eucalypti	*Austrocaligula eucalypti*
Opodiphthera excavus	*Neodiphthera excavus*
Opodiphthera fervida	*Austrocaligula fervida*
Opodiphthera helena	*Austrocaligula helena*
Opodiphthera loranthi	*Austrocaligula loranthi*
Opodiphthera rhythmica	*Neodiphthera rhythmica*
Opodiphthera saccopoea	*Neodiphthera saccopoea*
Samia cynthia	*Samia cynthia*
	Syntherata escarlata Lane, Edwards & Naumann, 2010

Syntherata janetta	*Syntherata janetta*
	Syntherata leonae, Lane, 2003
Synonym of *S. janetta*	*Syntherata melvilla*
	Syntherata mirata, Lane, Edwards & Naumann, 2010
	Syntherata pseudescarlata, Lane, Edwards & Naumann, 2010

Twelve days on from when I took the larva photo, Lois informs me it is doing well and has grown to about 8cm. To her amusement, and a testament to her observation skills, Lois also informs me that the larva's frass[3] has grooves.

Note: In *Metamorphosis Australia* Issue No. 51, December 2008, I wrote an article simply titled Saturniidae; all the images in this article referred to as *S. janetta*.

In preparing this article I am indebted to David Lane who was quick to reply to all my queries.

PS On the 1/05/2019 Erica Siegel placed images of Lois's larva on the Bowerbird citizen science web site and the Australian Butterfly & Moth Enthusiasts Facebook page. Lois informs me that, on the evening of 2/05/2019, the larva started to pupate and by the morning of 3/05/2019 it was completely cocooned, giving the duration of the 5th instar as about 18 days.

Glossary:

1: scolus, (scoli, plural); an outgrowth of the body wall in larvae, bearing branches of setae[4]
2: polyphagous; feeds on several species of plants
3: frass; solid larval insect excrement
4: seta, (setae, plural) a hair

Abbreviations:

Comb. Nov.: New Combination
Comb. Rev.: Species returned to a genus in which it was previously placed

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Lane, D.A., Edwards, E.D. & Naumann, S. 2010: A revision of the genus *Syntherata* Maasen, 1873 (Lepidoptera: Saturniidae) within Australia, with the description of three new species, and descriptions of their life histories, *The European Entomologist*, Volume 3, Part 1

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Saturniidae Gallery

Two extreme forms of *Syntherata janetta*

Two extreme forms of *Syntherata escarlata*

Neodipthera rhymica

Neodipthera sulphurea

Austrocaligula engaea

Austrocaligula eucalypti

Austrocaligula helena

Austrocaligula loranthi

(above) *Opodipthera astrophela*

(right) *Coscincera hercules*

Photos Peter Hendry

REPORTS

Mary Cairncross Park and Environmental Centre – Wednesday 13 February 2019 – *Dawn Franzmann*

On Wednesday 13th February, eight members and one friend had a very educational and enjoyable day experiencing the wonders of the Mary Cairncross Park and its surrounds. This beautiful patch of untouched and never been logged rain forest was bequeathed to the local community by its original owners. The three Thynne sisters named the Park after their mother Mary Thynne (formerly Cairncross).

The day was pleasant in that it was very clear and the view to the Glasshouse Mountains was quite spectacular. The temperature left a little to be desired. Rather hot, but cooler than in Brisbane.

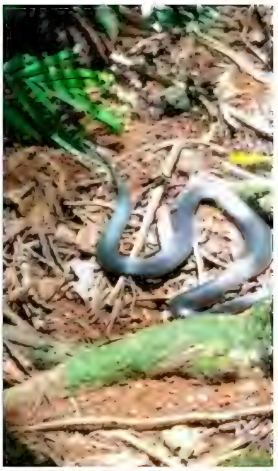
We gathered at 10 am and enjoyed a coffee before we met our Volunteer Guide, Keith. He had a tremendous amount of knowledge of the Park.

Along the walk, we spotted lots of butterflies. Some were Richmond Birdwing, Blue Triangles, Pale Triangle, Black Jezebels, Bordered Rustics, Tailed Emperors, Yellow Migrants, Lemon Migrants, and several Lycaenids.

Other things of interest that we spotted were lots of Red Cedars, Sassafras, Strangler Figs, Picabeen Palms and several varies of fungi.

There were many Pademelons hopping along the track. They are very friendly to humans. The Red Belly Black snake maybe isn't so friendly to humans.

The sound of the birdlife was pleasant as we walked along the tracks. The call of the Wompoo Pigeons announcing to their friends that there were some interlopers on the track was quite entertaining. The sounds of the Whip Bird and Cat Birds never fail to impress. Also, some Regent Bower Birds were spotted.



Our guided tour finished at 12.30pm. We all stayed to have lunch at the Café and visit the Interactive Centre. The staff members were very welcoming and we made some new friends who have promised to become members of BOIC. Thank you to Ian and Judy Ferrier for organizing and coordinating this excursion.

Photos Ian Ferrier

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World Science Festival – Street Science, Brisbane – 2019 – BOIC Display – *Dawn Franzmann* and *Chris Sanderson*

A little history about the World Science Festival. The Festival was founded in 2008 by Brian Green, a Professor of Mathematics at Columbia University, USA and Tracy Day, who is now the CEO of the festival. Since 2016, Brisbane has been granted the rights to hold the Festival under the auspice of the Queensland Museum Networks. Brisbane will host the festival until 2021.
We were privileged to have been invited by Chris Sanderson, of the Butterflies Australia Project, to participate in a two hour segment he had been offered by the Australian Citizen Science Association's Queensland chapter on Saturday 23 and Sunday 24 March. We have made a commitment to help him promote his project and the accompanying app within the Community.

We had applied for an Activity Space of our own during the World Science Festival, Street Science but were unsuccessful with our application. We accepted the offer to partner with Chris with much enthusiasm and excitement. This gave us a second chance to showcase our club as well help advertise the Butterflies Australia Project within the community.

As is the custom with this festival we were not allowed to sell any goods. However, the positive side for us was to be able to showcase our club on a world stage. We had

visitors from overseas countries, all interested in our Australian butterflies and insects.

After many hours of organising, we were ready. Wearing our new club polo shirts and equipped with our free handouts i.e. book marks, host plant lists and membership flyers, we were ready to answer the hundreds of questions put to us about many and varied topics. The joy of seeing a child's face light up as they saw for the first time their favourite butterfly, live and flying was an immense pleasure.

Our display consisted of live butterflies, pinned butterflies and other insects, posters and books. During the four hours over this weekend we had approximately 1,100 people pass through our display. Seven club members participated and manned the display over the weekend.

Dawn Franzmann – Butterfly and Other Invertebrates Club Inc.

For the Butterflies Australia Project the weekend was a huge success. Getting to talk to over 1000 interested people about butterflies alone was amazing, but we were also lucky enough to be visited by the current Chief Scientist of Queensland, Paul Bertsch, who showed a strong interest in our use of technology in conservation and citizen science. We were able to have a prototype of the field guide component of the app on display at the weekend, which was helpful in capturing people's interest, and it was fantastic having Dawn using her tablet with the app loaded up to help show people how it looked.

I think it's fair to say that I couldn't have been a part of the World Science Festival this year without all the help and enthusiasm from Dawn and the BOIC team, and I look forwards to hopefully putting in a joint application with the club for next year, when we should have a fully functional Butterflies Australia app to showcase.

Chris Sanderson –The Butterflies Australia Project

Photos Chris Sanderson

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History of the Host Plant Book presented at the 2019 AGM by *Dawn Franzmann*, Secretary, BOIC

In 1992, Helen Schwencke and Frank Jordan compiled a list of host plants. This list was based on a list they had compiled of possible host plants found in the Kedron Brook Creek catchment. This edition was printed on a double-sided A4 sheet. This list proved to be a very popular handout at BOIC displays.

Early in 2002 with very few changes the list was reproduced. This edition took the form of an A5 booklet.

By August 2002, it was realised that this list was now out of date. Daphne Bowden approached Helen and Frank and with their permission asked John Moss to help her update this list of host plants. John readily agreed.

Armed with many records from other groups and individuals, including John's personal notes and based on the original list and a new name, the 1st edition of the Butterfly Host Plants of South-east Queensland and Northern New South Wales was born.

The book gained popularity within the community. About this time it was realised that a reverse index would be of benefit. The expertise of a dedicated Club member, Peter Hendry was sought. Peter created the reverse index. In 2005 the expanded Second (revised edition) was created. Special thanks to Peter.

2010 - The BOIC Host Plant Book, as it was commonly called in the field was becoming a must for the butterfly enthusiast. Ross Kendall came on board with his expert skills in word processing and editing. Due, to popular demand the third edition was printed and published. The book had grown up and now become a hard cover. Almost 1000 copies were sold.

Stages of the development of the Host Plant book
Photo Dawn Franzmann

BOIC members involved with the production of the 4th edition – from left – Ross, Peter, John
Photo Alisha Steward

Now to the present – The thought of having to go through the lengthy process of updating once again was daunting to say the least. However, the need was great and a final agreement, with an end date to produce a fourth edition, was reached in November 2018. Over Christmas 2018, John worked tirelessly to collate his notes and those from many varied community members into a draft that Ross could fine-tune to become the fourth edition. Ross worked many a long night in the early part of 2019 to get the book to a stage for proof-reading by John and Daphne. Peter Hendry again helped to solve difficult formatting problems. Now we have a further expanded, hard cover, glossy, yellow edition. Certainly, a worthy combined effort from many Club members over many years. CONGRATULATIONS.

BOOK REVIEW

Butterfly Host Plants of South-east Queensland and Northern New South Wales – Reviewed by *Helen Schwencke*

Butterfly Host Plants of South-east Queensland and Northern New South Wales is a booklet that is rarely far from my reach at any time on many a day. Congratulations to John Moss, everyone whose records are included in this booklet and to the Butterfly & Other Invertebrates Club for continuing to support the project. It's an incredibly useful list of plants that needs to gain a much higher profile as interest in butterflies and other invertebrates is increasing rapidly.

I've had the privilege of watching the book develop through its early incarnations and then iterations. I saw, and had a hand in, it starting life from 1983, well before BOIC was formed. At that time it was a number of lists from Lepidopterists such as Garry Sankowski and Bob Moffat, Queensland Naturalists' Club reports, and likely others whose names have now (regretfully) escaped me. A Wildlife Preservation Society of Queensland project in 1992, undertaken by Frank Jordan and myself, with the aim of identifying which butterfly host plants could have occurred in the Kedron Brook Catchment and be included in revegetation and regeneration projects, saw the lists become consolidated. It was at this time that the structure of the current edition was developed – by height or canopy layer. With BOIC's formation it became a list that gained a wider circulation. Subsequently in something like its current form, with many other records added through thorough searching of published records, it became the first Butterfly Host Plant booklet in 2002.

The value of the book is that I can use it with a very high degree of confidence that the information is verified and accurate. That is, someone has raised the caterpillars through all their life stages and had healthy adult butterflies emerge. Especially valuable is that it shows new host plant records with the new observer's initials attached, indicating that this has only been observed the one time and is waiting for others to also observe the plant's usage by that butterfly species.

As I continue to work in the field of promoting butterflies and their larval food plants, I come across many plants on lists that I'm very uncertain about, and often not closely related to other species the butterfly is using. This makes promoting some butterfly host plants challenging as this information sadly remains in circulation for a very long time.

I recommend to others in this field that they follow the Butterfly Host Plant book's example and start compiling accurate and verified butterfly (and other invertebrates) host plant lists for their bio-regions

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BOIC Committee 2019
From left –
Ross Kendall, President
Dawn Franzmann, Secretary
John Moss, Comm. Memb.
David Exton, Comm. Memb.
Richard Zietek, Vice Pres.
Rob MacSloy, Treasurer

Photo Alisha Steward

BUTTERFLY AND OTHER INVERTEBRATES CLUB PROGRAMME

Planning and General Meeting

What? Our quarterly planning meetings are informative and interesting and we welcome members to contribute to discussion. This meeting will be followed by an event organised by BOIC at the Downfall Creek Bushland Centre. A "Panel of Experts" will be assembled, to identify host plants, butterflies, and any other invertebrates. Live specimens, pinned specimens and photos will be accepted for identification. BOIC insect and butterfly collections will be available for viewing. Also, we will have the Club microscope in action, to enable people to see their favourite insect in a larger scale. All members of BOIC and members of the public are invited to participate. BOIC is being assisted by the Centre to hold this event.

When? Saturday 10th August 2019

Where? Downfall Creek Bushland Centre, Rode Road, Chermside West.

RSVP to Dawn Franzmann, Secretary BOIC on 0419 786369 or email:
secretaryboic@gmail.com

DISCLAIMER

The magazine seeks to be as scientifically accurate as possible but the views, opinions, and observations expressed are those of the authors. The magazine is a platform for people, both amateur and professional, to express their views and observations about invertebrates. These are not necessarily those of the BOIC. The manuscripts are submitted for comment to entomologists or people working in the area of the topic being discussed. If inaccuracies have inadvertently occurred and are brought to our attention we will seek to correct them in future editions. The Editor reserves the right to refuse to print any matter which is unsuitable, inappropriate or objectionable and to make nomenclature changes as appropriate.

ACKNOWLEDGMENTS

Producing this magazine is done with the efforts of:

- Those members who have sent in letters and articles
- Alexander Davies who provided the cover drawing
- Daphne Bowden who works on layout, production, and distribution
- Trevor Lambkin, John Moss, Kelvyn Dunn, Bernie Franzmann, Peter Hendry, David Lane and Ross Kendall for scientific referencing and proof-reading of various articles in this issue of the magazine

ARE YOU A MEMBER?

Please check your mailing label for the date your membership is due for renewal. If your membership is due, please renew as soon as possible. **Annual membership fees are $30.00 for individuals, schools, and organizations**. If you wish to pay electronically, the following information will assist you: BSB: **484-799**, Account No: **001227191**, Account name: **BOIC**, Bank: **Suncorp**, Reference: your membership number and surname e.g. **234 Roberts.**

Butterfly and Other Invertebrates Club Inc.
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Next Club event – Planning and General Meeting, Saturday 10th August 2019
See Programme for details